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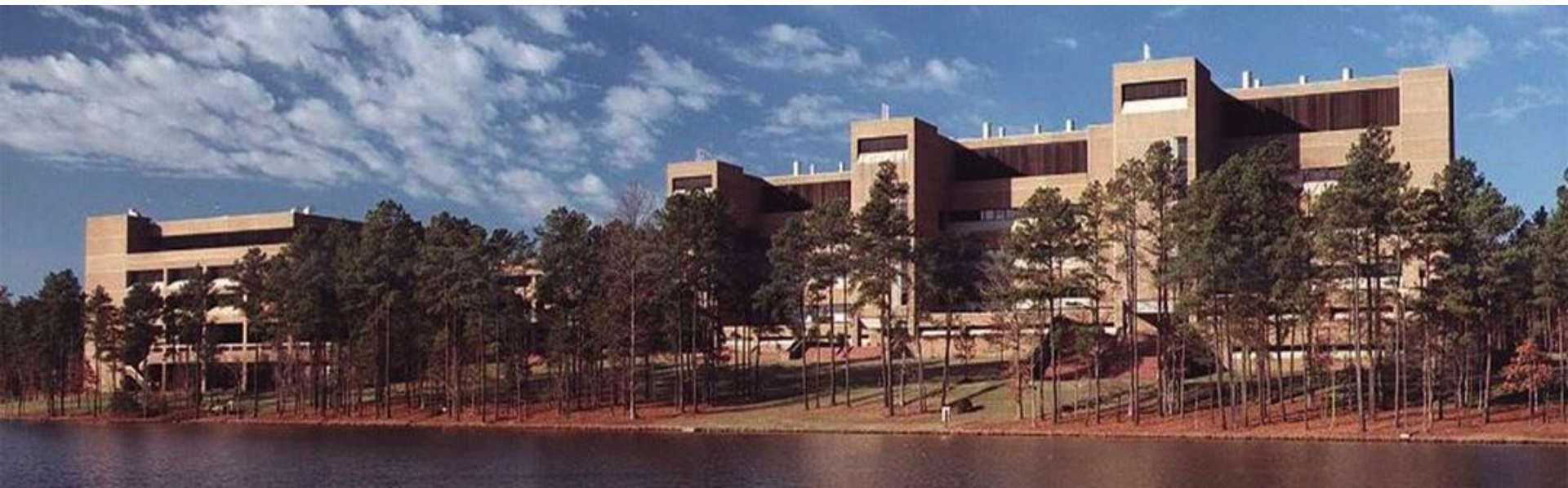
# **NIH Disaster Research Response (DR2) Program: Improving Timely Environmental Health Research**

**CIHR Best Brains Exchange  
Ottawa, Canada**

**Aubrey Miller, MD, MPH  
February 19, 2016**

# The National Institute of Environmental Health Sciences

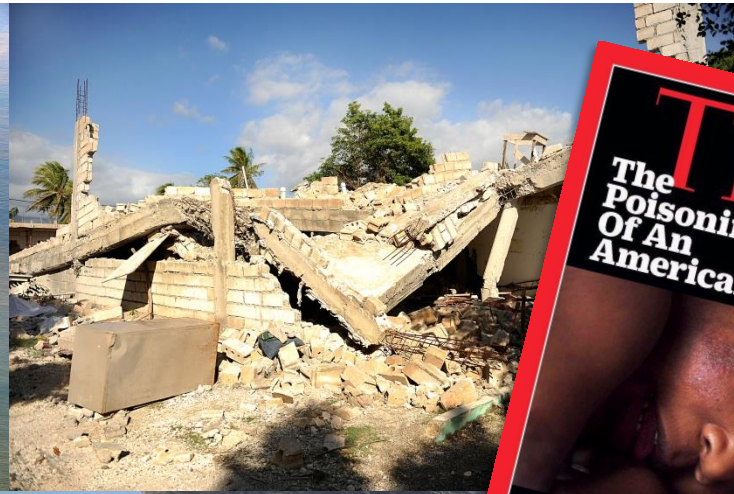
- One of the National Institutes of Health, but located in Research Triangle Park, NC
- Wide variety of programs supporting our mission of environmental health:
  - Intramural laboratories
  - Extramural funding programs
  - Disease Prevention
  - Clinical research program
  - National Toxicology Program
  - Public Health Focus





# Each disaster presents new issues & uncertainties

## Research is vital to inform the response, recovery, and future events



# Health Impacts of World Trade Center (WTC) Attack

- Widespread contamination
- USGS identified complex, mixed exposures
- **WTC Medical Monitoring program findings**

- Study of 27,500 Responders

|              |      |
|--------------|------|
| ■ Asthma     | 28 % |
| ■ Sinusitis  | 42 % |
| ■ Lung Tests | 42 % |
| ■ PTSD       | 9 %  |
| ■ Panic      | 8 %  |
| ■ Depression | 28 % |



\*Wisnivesky et al, 2011. Lancet. 378:9794:888-897



# Gulf Oil Spill April 2010

**11 workers killed, 17 injured, 98 survivors**

- **Exposures of Concern:**

- Oil Components
  - Poly-aromatic hydrocarbons (PAHs)
  - Volatile organic chemicals (VOCs)
  - Heavy metals
- Dispersants
- Burning Particulate

- **Health Concerns:**

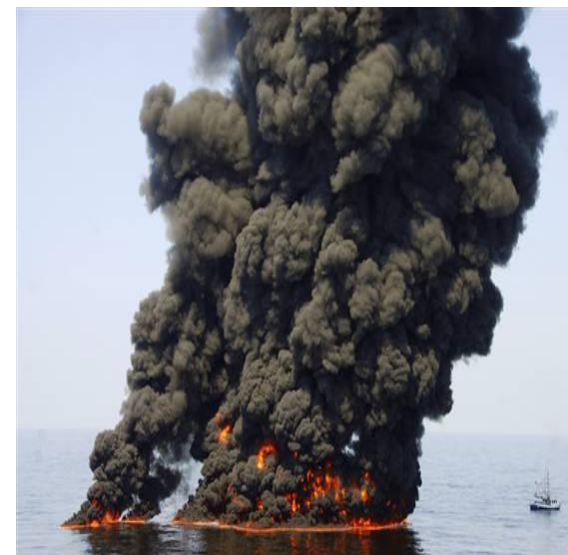
- Skin
- Lungs
- Eating contaminated seafood
- Mental health



# Gulf Oil Spill April 2010

- Little known about long-term health effects!
- Hundreds of large (>700 tons) tanker oil spills in past 40 years
- Only 8 health studies & all but one was cross-sectional or very short term

|                                    | <u>Barrels of Oil</u> (1 B = ~ 40 gallons) |
|------------------------------------|--|
| 1989 <b>Exxon Valdez, USA</b>      | 270,000                                    |
| 1993 MV Braer, UK                  | 620,000                                    |
| 1996 Sea Empress, UK               | 525,000                                    |
| 1997 Nakhodka, Japan               | >44,000                                    |
| 1999 Erika, France                 | 146,000                                    |
| 2002 Prestige, Spain               | 460,000                                    |
| 2003 Tasman Spirit, Pakistan       | 270,000                                    |
| 2007 Hebei Spirit, South Korea     | 73,000                                     |
| <b>2010 Deepwater Horizon, USA</b> | <b>4,900,000</b>                           |



- Dispersant Use > 1.8 M gallons

# Gulf Oil Spill: Rapid Public Health Responses

- **Acute Symptom Surveillance**
  - Sentinel hospitals, Workplace reports, Poison Control Centers
- **Focused Surveys of Specific Populations**
  - NIOSH worker investigations (Health Hazard Evaluations)
  - Community Assessment for Public Health Emergency Response (CASPER)
  - Community Surveys (e.g., LA Bucket Brigade)
- **Acute responses NOT designed to understand longer-term physical and mental health or other consequences**

# IOM Oil Spill Workshop, New Orleans. June 22-23, 2010



The screenshot shows the homepage of the Institute of Medicine (IOM) of the National Academies. The header includes the IOM logo and the tagline "Advising the Nation. Improving Health." Navigation links for "Media Room", "Directory", "Meetings and Events", and "Member Login" are in the top right. A green navigation bar contains "ABOUT THE IOM", "REPORTS", and "ACTIVITIES". Below this is a "Browse History" section. The main content area features an "ACTIVITY" titled "Assessing the Human Health Effects of the Gulf of Mexico Oil Spill" dated 6/17/2010. The text describes the workshop and its focus on the health impacts of the Exxon Valdez oil spill. A "Read More »" link is provided. To the right of the text is a photograph of a person sitting on a pier looking out at the ocean during sunset.

Media Room | Directory | Meetings and Events | Member Login

INSTITUTE OF MEDICINE  
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ABOUT THE IOM | REPORTS | ACTIVITIES

Explore by Topic | Keyword Search

Browse History | Sign up for E-mail Updates | RSS | Text Size

**ACTIVITY**  
**Assessing the Human Health Effects of the Gulf of Mexico Oil Spill**  
6/17/2010

Decades later, we still can feel the consequences of the Exxon Valdez oil spill. How will the even larger crisis in the Gulf impact our health? The IOM will hold a meeting June 22-23 to discuss the health issues for those living and working near the Gulf.

Read More »

## Key Points

- Longitudinal human health research is clearly indicated
- Health studies should begin as soon as possible
- Mental health and psychosocial impacts must not be overlooked
- Sensitive populations need to be monitored
- External stakeholders must be part of the process
- Data and data systems should be developed to support wider research efforts





# NIH Gulf Oil Spill: Research Responses



## Toxicology Research



## Intramural Research



## Worker Training *Oil Spill Cleanup Initiative*

**Deepwater Horizon Research Consortia:**  
Health Impacts & Community Resiliency

## Extramural Research

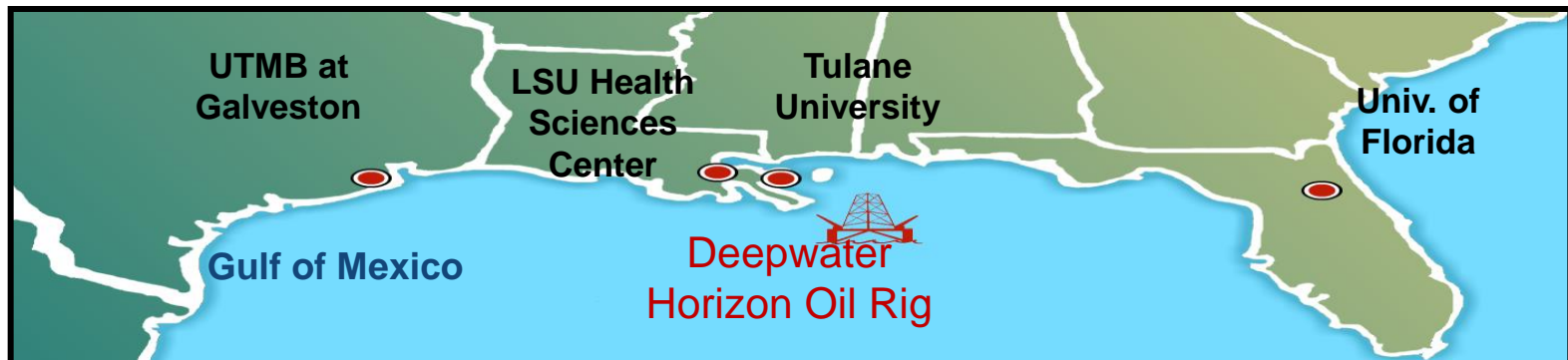


Partnership

## Deep Water Horizon (DWH) Research Consortium



- Trans-NIH effort of university & community partnerships
- Population-based & lab research
- Studies designed together to assess health impacts on Gulf Coast communities
- Build capacity, train residents, further env. health literacy



# Oil Spill Research Challenges

- **Study Populations: Workers and Volunteers**
  - Use of NIOSH roster & combining multiple lists (BP, national guard)
- **Study Development Process**
  - IRB, OMB, & Certificates of Confidentiality
- **Baseline Data for Comparison**
  - Available only for small fraction of cohort (e.g., Coast Guard)
    - Health information, biospecimens, relevant tests ??
- **Exposure Reconstruction**
  - Multiple databases that need to be integrated
  - Available data difficult to use to reconstruct exposures
- **Timeliness of Extramural Awards & Initiation of Studies**



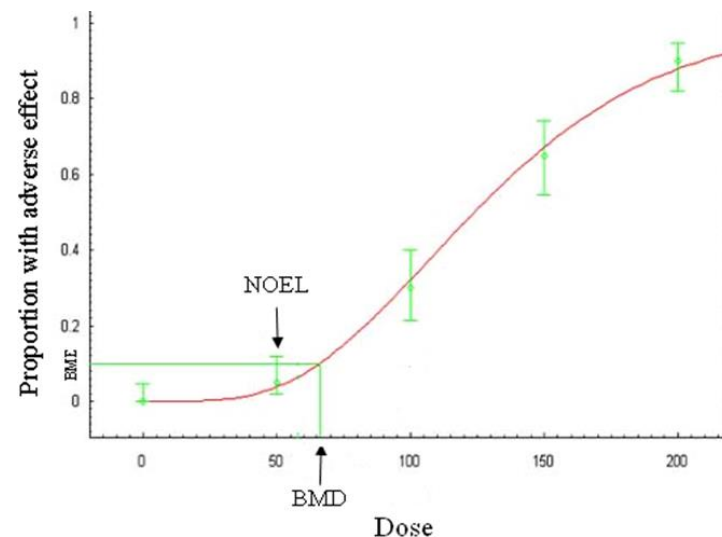
## Charleston, West Virginia: Elk River Chemical Spill

- Crude 4- methylcyclohexanemethanol (MCHM) plus other chemicals were released from a Freedom Industries facility
- Water use suspended for 300,000 people in nine counties
- >500 hospital visits: reported nausea, vomiting, rashes, lung & eye irritation
- Unknown health effects of released chemical
- **Residents told to not drink, bathe, cook or wash with tap water due to uncertainty**





www.TheSilverPen.com



## Lingering Questions of Concern:

- Can MCHM affect development of an unborn child?
- Are there long-term effects?
- How reliable are the studies on MCHM used to identify a safe level?
- Chance of the spilled chemicals having surprising health effects?

**>80,000 chemicals in the US have never been tested for their toxic effects on health & the environment**



# NTP Studies to Help Assess Various Uncertainties related to MCHM & other chemicals of interest

|  | Studies               |  |                         |                   |                         |                   |                         |                           |  |
|--|-----------------------|--|-------------------------|-------------------|-------------------------|-------------------|-------------------------|---------------------------|--|
| Questions of Concern                   | Rat Prenatal Toxicity | Mouse Dermal Irritation and Hypersensitivity | 5-Day Rat Toxicogenomic | DNA Damage Assays | Zebrafish Developmental | Nematode Toxicity | Immune Toxicity Studies | High Throughput Screening | Computer Modeling / Structure Activity Relationship (SAR) Analysis |
| Can MCHM affect an unborn child?       | X                     |  |                         | X                 | X                       | X                 |                         |                           | X  |
| Are there long-term effects?           | X                     |  |                         | X                 |                         |                   | X                       |                           | X  |
| Reliability of studies for safe level? | X                     | X  | X                       |                   |                         |                   |                         |                           |  |
| Surprising toxicological effects?      |                       |  |                         | X                 | X                       | X                 |                         | X                         | X  |

Guideline  
Non-guideline



# Moving from Public Health Practice to Research

- **Building on acute response platforms** (surveillance, cross sectional)
  - Ad-hoc convenience based investigations to hypothesis driven research
  - Integrating into response activities effectively without impediment
  - Feedback to identify research priorities and opportunities
- **Who needs to be looked at?:** high-risk groups, kids, elderly, EJ community
- **What additional information do we need?:** to understand health effects

## Missed Opportunities for Key Questions!

- H1N1 Response- treatment research, IRB issues
- DWH Oil Spill - 9 months to start GuLF Study
- Hurricane Sandy- 11 months to fund extramural efforts



# Need for Environmental & Occupational Health Data

- **Is it safe?**

- For whom, what, when, and where?
- Longer-term physical & mental health impacts?
- Safety of homes, residences, work places



- **Focal areas of research**

1. Environmental Exposures
2. Health Risks and Effects
3. Value of Interventions or Mitigation Strategies
4. Ecosystem Effects



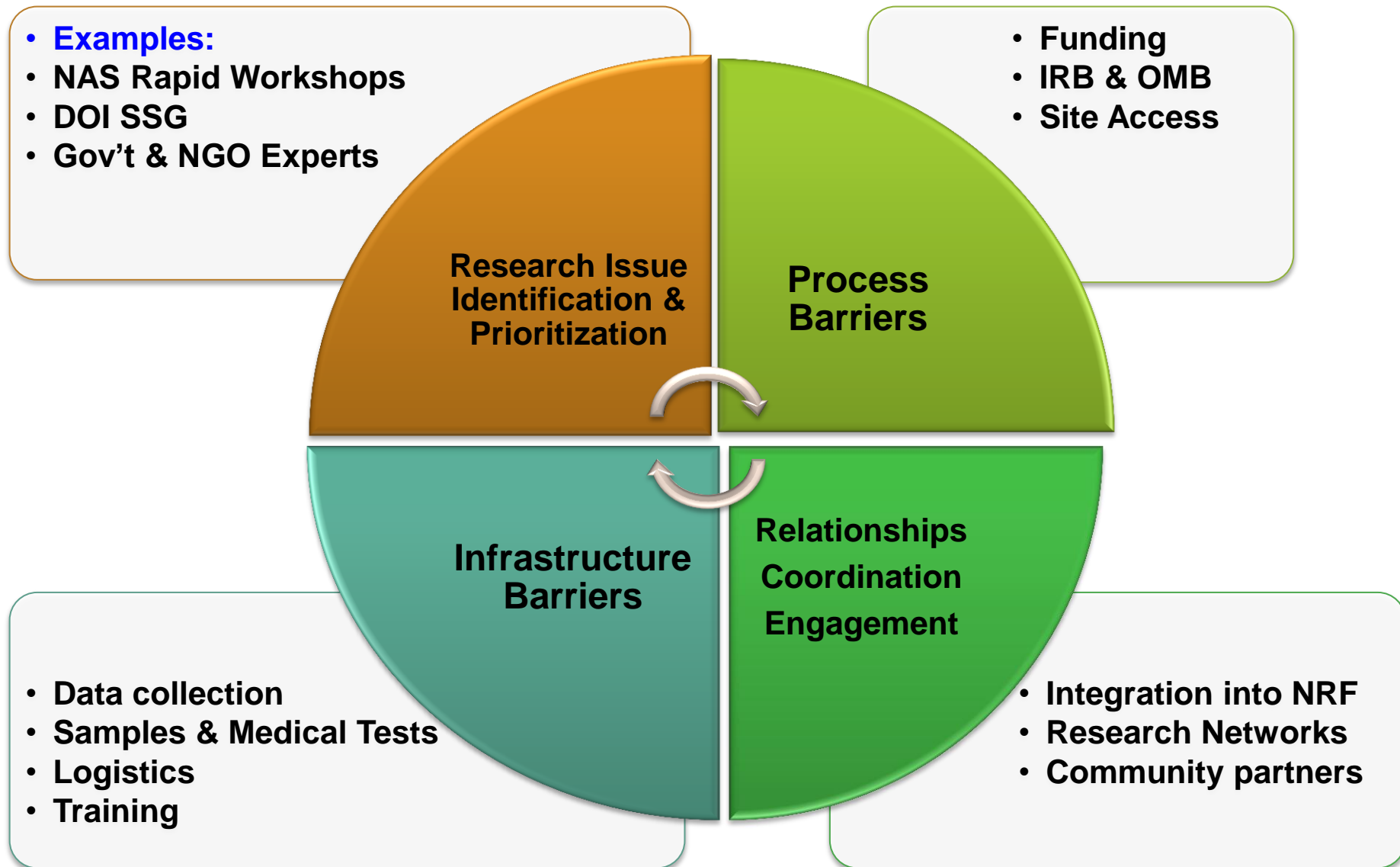
# NIH Disaster Research Response (DR2) Program

**Improving Disaster Responses, Reducing Health Impacts, and Preventing future harm through:**

1. Identification of important research questions and priorities
2. Improved access to data collection tools for researchers
3. Improved NIEHS & partner capability to quickly collect data
4. Trained researchers versed in disaster tools and issues
5. Integration into planning and emergency response systems
6. Research process including public health, academia, and impacted workers and communities



# Efforts to Improve Timely Research in Four Areas



# Identifying Research Priorities

- **Improved use of Networks**

- NIH Environmental Health Sciences Network
- NIH Disaster Interest Group & ASPR SPIRIT

- **Exploring other models**

- DOI Science Support Group (SSG)
- National Academies of Science (Hurricane Sandy, Gulf Spill)
  - **New: NAS Committee** to pull together experts for disasters
    - Ebola Research Priorities Workshop (Nov. 2014)\*
    - Zika Virus Workshop (Feb. 2016)

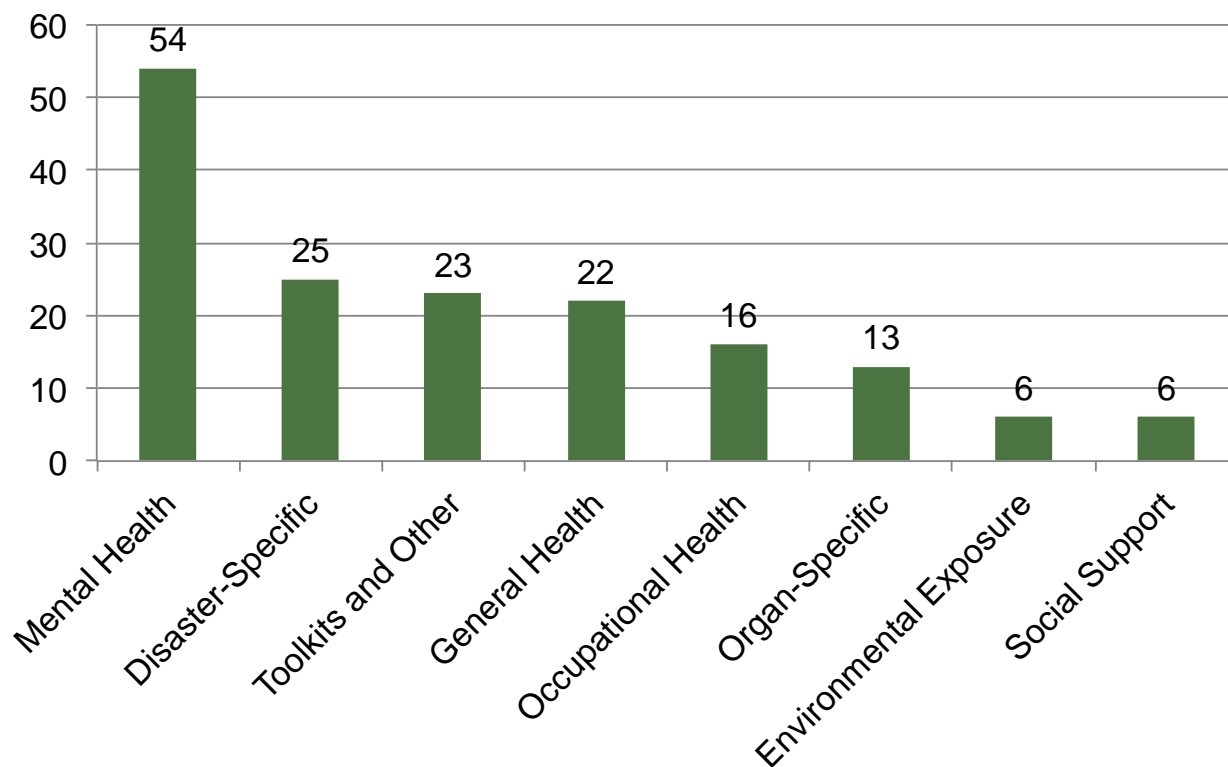


# DR2 Repository of Data Collection Tools

## Surveys, Questionnaires, Protocols, Guidance, Forms

- 165 Tools to help start early baselines and identified research
- Implementation guidance, forms, training (e.g., consents, clinical testing)
- Available to all researchers regardless of event

8 categories initially





# NIH DR2 Tools - Compiling Metadata for Repository

- Short Description and # of Items
- Purpose and Uses
- Mode of Administration
- Time to Administer
- Population of Interest
- Existence of Validity Studies
- Languages/Reading Level
- Special Interviewer Training
- History of Use in the Disaster Setting
- Professional Admin Requirements
- Ease of Use in Disaster
- Availability

## New Improvements under way:

- Tools: downloadable files (MS Word & EpiInfo) for paper or electronic entry
- Improved searching and sorting into categories
- Creation of Survey Builder functionality using EpiInfo




# NIH DR2 Web Site

<http://dr2.nlm.nih.gov>

U.S. Department of Health and Human Services

## NIH Disaster Research


[Home](#) [Tools & Resources](#) [Training & Exercises](#)



### Tools & Resources

A searchable database of federally reviewed research tools including surveys, questionnaires, clinical forms, etc., meant to help establish baseline data and cohorts for research following disasters. [Learn more](#)

[Find Tools & Resources](#)



### Networks

The Environmental Health Science Disaster Research Network is a new group consisting of NIEHS-sponsored research centers, grantees, academic partners interested in facilitating improved national research capabilities and responding to environmental emergencies and disasters.

[Learn More](#)

## Refine Your Results

### Data Collection on

- ☒ Environmental Exposure(s) (6)
- ☐ General Health (22)
- ☐ Mental Health (54)
- ☐ Occupational Health (16)
- ☐ Social Support (6)
- ☐ Specific Body Systems (13)
- ☐ Specific Disasters (25)
- ☐ N/A (22)

### Publication Year

- ☐ Unknown (6)

Search

Clear Search Terms

Print/Download

Displaying records 1 - 6 of 6

Expand All

Collapse All

Page 1 of 1

Results/Page 10

Sort Newest First

## 1. [Appendix D: Recognition and Management of Mold-Related Illness Table B: Questions for Patients with Common Symptoms; Table C: Environmental Questionnaire; Table D: Current Symptoms](#)

**Source:** National Institutes of Health, Disaster Research Response Project

**Annotation:** University of Connecticut Health Center, Division of Occupational and Environmental Medicine, Center for Indoor Environments and Health has mold questionnaires in Tables B, C, and D of Appendix D (page D-1) of "Guidance for Clinicians on the Recognition and Management of Health Effects related to Mold Exposure and Moisture Indoors." Questionnaires in the tables consist of a general health history, items pertaining to possible symptoms, work/residence settings and locations for the respondent, potential exposures, and diagnostic assessment. Table B: Questions for Patients with Common Symptoms is on page D-3. Table C: Environmental Questionnaire is on page D-4. Table D: Current Symptoms: History and Relationship to Home, Work, or School (For Patients in which a Potential Exposure to Mold Exists) is on page D-6.

Ease of Use in Disaster Setting: Moderate

Population: Residential/Workplace

Length: 50 questions

Administered by: Self Administered/Self Report

Language(s): English

[\[less\]](#)

**URL:** <http://www.oehc.uchc.edu/clinser/MOLD%20GUIDE.pdf>

**ID:** 7815. From [Disaster Lit](#), a database of the U.S. National Library of Medicine.

## 2. [QEESI \(Quick Environmental Exposure and Sensitivity Inventory\)](#)

**Source:** National Institutes of Health, Disaster Research Response Project

**Annotation:** This validated questionnaire, the Quick Environmental Exposure and Sensitivity Inventory, or QEESI®, also known as the "TILT Test," helps researchers, doctors, and their patients identify individuals with multiple chemical intolerances. The QEESI was developed as a screening questionnaire for multiple chemical intolerances (MCI). The instrument has four scales: Symptom Severity, Chemical Intolerances, Other Intolerances, and Life Impact. It can be used to assess the onset of new or intensified symptoms following an event.

# NIEHS Rapid Response Data Collection Team

## Support for National Research Capacity

- **Deployment of Intramural Clinical Program Assets** (support contract)
  - **Technical Support** (assistance with questionnaires etc.)
  - **Field support for data and specimen collection for others**
  - **NIEHS Study Implementation**
    - **Rapid Acquisition of Pre/Post Incident Data (RAPIDD)**
      - Questionnaires
      - Biospecimen Collection
      - Medical Testing



# Rapid Acquisition of Pre/Post Incident Disaster Data (RAPIDD) Protocol

- **Reduce the time it takes to initiate data collection**
  - Pre-reviewed by IRB (*NIEHS IRB provisional approval granted May 2015*)
  - Standardized methods using established instruments
  - Pre-positioned study documents, questionnaires, supplies, and staff
- **Initial Goal: Timely research of workers involved in a response**
  - Contact information for cohort development
  - Gather early survey information
  - Collect biospecimens and baseline medical tests (e.g., PFT)
    - *Core: 29 questions ~ 5 mins*
    - *Basic: 89 questions ~ 10 mins*
    - *Enhanced: 184 questions ~20 mins*





## Questionnaire

| Questionnaire & Brief Description                           | # Questions | Estimated Time | Select?   |
|---|-------------|----------------|---|
| <b>Registry Basic Core Form</b>                             | 26          | 5 minutes      | Yes <input type="checkbox"/> No <input type="checkbox"/>        |
| <b>Registry Enhanced Core Form</b>                          | 36          | 10 Minutes     | Yes <input type="checkbox"/> No <input type="checkbox"/>        |
| <b>Demographics and Sociological Factors</b>                | 16          | 5 Minutes      | Yes <input type="checkbox"/> No <input type="checkbox"/>        |
| <b>ERHMS/ATSDR Based Deployment Module</b>                  | 8           | Unavailable    | Yes <input type="checkbox"/> No <input type="checkbox"/>        |
| <b>General Health</b>                                       |             |                | <b>Yes <input type="checkbox"/> No <input type="checkbox"/></b> |
| <b>ACE General Survey – Medical History Module F.</b>       | 19          | Unavailable    | Yes <input type="checkbox"/> No <input type="checkbox"/>        |
| <b>ERHMS Basic Pre – Deployment Health Screening</b>        | 12          | Unavailable    | Yes <input type="checkbox"/> No <input type="checkbox"/>        |
| <b>ACE General Survey - Acute Health Effects Module B</b>   | 57          | Unavailable    | Yes <input type="checkbox"/> No <input type="checkbox"/>        |
| <b>Rand Medical Outcomes Study Short Form Survey 20</b>     | 20          | 5- 10 minutes  | Yes <input type="checkbox"/> No <input type="checkbox"/>        |
| <b>Veterans Rand 12 Health Survey (VR-12)</b>               | 12          | 7 Minutes      | Yes <input type="checkbox"/> No <input type="checkbox"/>        |
| <b>NHANES 2013 -2014 Physical activity/ Fitness Module</b>  | 21          | Unavailable    | Yes <input type="checkbox"/> No <input type="checkbox"/>        |
| <b>Measures of Overall Psychological Well-Being</b>         |             |                | <b>Yes <input type="checkbox"/> No <input type="checkbox"/></b> |
| <b>Kessler 6 (K6)</b>                                       | 6           | 2-3 minutes    | Yes <input type="checkbox"/> No <input type="checkbox"/>        |
| <b>Kessler 10 (K10)</b>                                     | 10          | 5 Minutes      | Yes <input type="checkbox"/> No <input type="checkbox"/>        |
| <b>Measure(s) of Post-Traumatic Stress Disorder (PTSD),</b> |             |                | <b>Yes <input type="checkbox"/> No <input type="checkbox"/></b> |
| <b>PTSD Self Rating Scale (PTSD-SRS)</b>                    | 17          | Unavailable    | Yes <input type="checkbox"/> No <input type="checkbox"/>        |
| <b>Primary Care PTSD Screen (PC-PTSD)</b>                   | 4           | 1-2 Minutes    | Yes <input type="checkbox"/> No <input type="checkbox"/>        |
| <b>Impact of Event Scale Revised (IES-R)</b>                | 22          | 10 Minutes     | Yes <input type="checkbox"/> No <input type="checkbox"/>        |
| <b>Measure(s) of Anxiety and Depression</b>                 |             |                | <b>Yes <input type="checkbox"/> No <input type="checkbox"/></b> |
| <b>Zung Self Rated Depression Scale</b>                     | 20          | 10 Minutes     | Yes <input type="checkbox"/> No <input type="checkbox"/>        |
| <b>Patient Health Questionnaire (PHQ)</b>                   | 11          | 5 Minutes      | Yes <input type="checkbox"/> No <input type="checkbox"/>        |

# IRB Approval Before Initiating Study

## Appendix B: Protocol Amendment Checklist

### I. Type of Disaster

| Natural Disasters                                    | Man-made and Technological Disasters                         |
|--|--|
| <input type="checkbox"/> Earthquake/Tsunami          | <input type="checkbox"/> Chemical release/Oil spill          |
| <input type="checkbox"/> Flood                       | <input type="checkbox"/> Biological emergency                |
| <input type="checkbox"/> Hurricane                   | <input type="checkbox"/> Radiological/Nuclear                |
| <input type="checkbox"/> Tornado                     | <input type="checkbox"/> Explosion                           |
| <input type="checkbox"/> Wildfire                    | <input type="checkbox"/> Civil unrest/ war                   |
| <input type="checkbox"/> Extreme Temperature/Drought | <input type="checkbox"/> Utility service disruption/blackout |
| <input type="checkbox"/> Other: _____                |  |

### II. Detailed description of disaster and justification for deployment:

### III. Research Setting: \_\_\_\_\_

### IV. Estimated Sample Size: \_\_\_\_\_

### V. Accrual duration: \_\_\_\_\_

### VI. Procedures:

|   |   |
|---|---|
| <input type="checkbox"/> Vital signs      | <input type="checkbox"/> Spirometry               |
| <input type="checkbox"/> Pulse Oximetry   | <input type="checkbox"/> Nail clipping collection |
| <input type="checkbox"/> Anthropometry    | <input type="checkbox"/> Saliva collection        |
| <input type="checkbox"/> Venipuncture     | <input type="checkbox"/> Buccal cell collection   |
| <input type="checkbox"/> Fingertick       | <input type="checkbox"/> Hair collection          |
| <input type="checkbox"/> Urine collection |   |
| <input type="checkbox"/> Other: _____     |   |

(Provide description of procedure and list document changes and section numbers in section X of this sheet.)

### VII. Questionnaires (check all that will be completed during the visit):

|   |   |
|---|---|
| <input type="checkbox"/> Registry Core Form | <input type="checkbox"/> Substance Use, Abuse, Dependence |
| <input type="checkbox"/> General Health     | <input type="checkbox"/> Exposures and Disaster Specific  |
| <input type="checkbox"/> Mental Health      | <input type="checkbox"/> Organ and Body Systems           |
| <input type="checkbox"/> Other: _____       |   |

## • Specifics of the disaster submitted to IRB for approval before starting study

- Research setting
- Sample size
- Accrual duration
- Procedures
- Questionnaires
- Outcomes of interest

- Grantees developing similar protocols
- NIEHS IRB “best practices workshop” & leading NIH
- Discussions started with OMB to support process

# IRBs & Ethical Conduct of Disaster-related Research

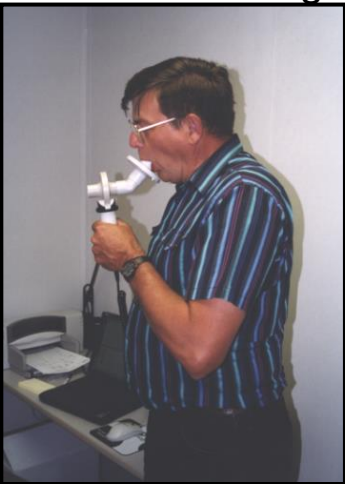
- **NIH Public Health Emergency Research Review Board (PHERRB)** <http://ohsr.od.nih.gov/OHSR/pherrb.php>
  - Provide IRB review of protocols that are conducted or supported by HHS and are multisite studies (e.g., H1N1)
  - Standard Operating Procedures approved August 2015
- **NIEHS Office of Human Research Compliance**
  - Provisional approval of NIEHS RAPIDD Protocol
  - “**Best Practices Working Group**” to develop recommendations for IRB review of protocols in response to disasters.
  - Focusing on ethical issues including vulnerability & informed consent
  - **Workshop July 2016 at NIEHS**

# Developing Training Materials, Field Guides, Go Kits

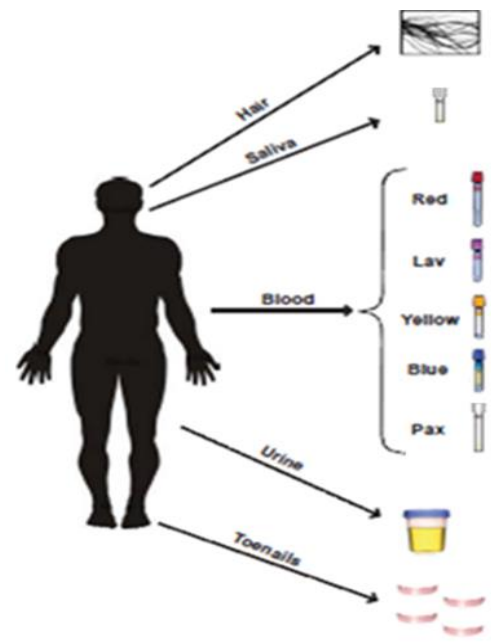
## Field Surveys



## Medical Testing



Sample Collection Go Kits



Possible Biospecimens





# DR2 Outreach, Implementation, & Integration with Partners

## Environmental Health Science (EHS) Network

**Vision:** working with our partners to...

Create a national “network” for timely environmental health research

### **Who:**

- **New EHS Network Workgroup**
  - NIEHS Training Program, Academic Centers, & Grantees
- **Federal Partners (HHS Agencies and Others)**
- **Other Stakeholders**
  - Public Health, Responders, & Community (incl. “citizen science”)



# Research Responder Training & Education

- **Training & Education** “those involved in research/data collection”
  1. National response plans and HHS mechanisms
  2. Training to use DR2 and other data collections tools, protocols, etc.
  3. Site/Situation Specific Health and Safety Issues
- **Training Exercises** on identified scenarios and issues

## Training Exercises

- 2014 Los Angeles & 2015 Houston
- Participants: federal, state, local, academia and community, industry
- Evaluate State and partner research capabilities & DR2 concepts & training tools
- Discussion: integration & issues of concern






# Texas OneGulf Disaster Research Response



# Measuring Environmental Exposures..next steps





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## Bracelets Can Detect Chemical Exposures


The next wave of wrist wear might act as a fashionable archive of your exposure to everything from caffeine to pesticides

**C**

Mar 7, 2014 | By Brian Bienkowski and Environmental Health News

Wristbands are the accessory of choice for people promoting a cause. And the next wave of wrist wear might act as a fashionable archive of your chemical exposure.

Researchers at Oregon State University outfitted volunteers with slightly modified silicone bracelets and then tested them for 1,200 substances. They detected several dozen compounds – everything from caffeine and cigarette smoke to flame retardants and pesticides.



Silicone in wristbands absorbs chemicals. Researchers used modified ones to test people's exposure to 1,200 substances, such as flame retardants and cigarette smoke.  
*Credit: LexnGer/Flickr*

Slide Courtesy: Dr. Kim Anderson Oregon State Univ.  
<http://eprep.oregonstate.edu/>



## Discussion Items – Organizational Capacity

- **What is your capacity to conduct timely health research after disasters?**
  - Who & how are decisions made regarding involvement, support, etc.?
  - Who is available and ready to participate? Training? How fast?
  - How fast can protocols, consent forms, etc. be developed & approved?
  - Ability to implement research (e.g., operating procedures, surveys, baseline health evaluations, collect & store biospecimens)?
  - Plans for data management and communication of results?
  - Role of your IRB?

## Discussion Items – Research Needs, Relationships, & Coordination

- **Relationship & coordination with academia, government organizations, business, and community groups to implement health research?**
  - What processes are in place to identify research needs and priorities?
  - Process for requesting support from the state, federal, others?
  - How can you be integrated into disaster health research efforts to collect needed data or information?
  - How can you coordinate with others to collect needed information?
  - How would new and existing collaborations be made and continued?



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**Thank You!**

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**DR2 Project Webpage**  
**<http://dr2.nlm.nih.gov>**



# Lesson Learned From Disaster Research Responses

- Early & consistent community engagement critical for study development, participation, implementation, & communications
- Combining federal efforts with state, academic, & community partners builds local infrastructure and resilience for the future
- Must include mental health & health care considerations during all health assessments of impacted communities
- All efforts should be made to identify issues of concern, assess exposures, and understand health effects as fast as possible